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T-58-103
TT-T-266
Amndt. 3

TT-T-266

AMENDMENT-3
MARCH 1, 1944

SUPERSEDING
AMENDMENT-2
January 7, 1944

FEDERAL STANDARD STOCK CATALOG

Section IV

(Part 5)

FEDERAL SPECIFICATION

FOR

THINNER, LACQUER*

This amendment was approved on the above date by the Director of Procurement, for the use of all departments and establishments of the Government, and shall become effective not later than May 1, 1944. It may be put into effect, however, at any earlier date after promulgation.

The following changes shall be made in Federal Specification TT-T-266, dated April 30, 1942:

Page 1:

Paragraph E-1a:

Line 2. Delete "0.820" and "0.860" and substitute "0.800" and "0.850" respectively.

Paragraph E-1b:

Line 2. Delete "80° C. (176° F.)" and substitute "70° C. (158° F.)"

Line 3. Delete "20" and substitute "45."

Line 5. Delete "50" and substitute "65."

Page TT-T-266-2:

Paragraph E-1c. Table:

Line 1. Column "Maximum." Delete "35" and substitute "40."

Column "Minimum." Delete "25" and substitute "30."

Line 2. Delete "Hydrocarbons (coal tar and petroleum)" and substitute "Petroleum Hydrocarbons."

*Certain provisions of this specification are intended to conserve critical or strategic materials. When the present emergency is over, this amendment will be considered for revision.

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SB 8847

TT-T-266
Amend.-3-2
(Mar. 1944)

FEDERAL STANDARD STOCK CATALOG
(Section IV, Part 5)

- Line 3. Column "Maximum." Delete "20" and substitute "10."
Column "Minimum." Delete "10" and substitute the character "—."
Paragraphs E-1m, E-1m (1) and E-1m (2). Delete in entirety.
Pages TT-T-266-2 and 3:
Paragraph F-2b:
Line 2. Delete "100.14" and substitute "100.15."
Line 5. Delete "86-30" and substitute "86-40."
Paragraph F-2c (2):
Line 1. Delete heading "Coal tar and petroleum hydrocarbon determination" and substitute "Petroleum hydrocarbon determination."
Line 9. Delete "coal tar and."
Pages TT-T-266-6 to 8, incl.:
Paragraphs F-2m to F-2m (7), including figure 1. Delete in their entirety.
Page TT-T-266-9:
Paragraph I-2. Insert subparagraphs I-2a and I-2a (1):
I-2a. The following formulation has been found to pass the requirements of this amendment:

	Weight (percent)	Volume (percent)
Butyl acetate.....	17	16
Ethyl acetate.....	20	19
Butyl alcohol.....	8	8
Ethyl alcohol.....	5	5
Petroleum naphtha.....	50	52
	100	100

- I-2a (1). The type of petroleum naphtha is that described as Type I, Grade B (Low Aromaticity) in Army-Navy Aeronautical Specification AN-VV-N-96. Ketones, such as methyl ethyl ketone, are not required, although they may be used up to a maximum of 10 percent.
Page TT-T-266-10:
Paragraph I-6:
Line 4. Delete "15" and substitute "25."

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 NOVEMBER 23, 1944
 SUPERSEDING
 AMENDMENT
 March 1, 1944

FEDERAL STANDARD STOCK CATALOG

Section IV

(Part 5)

FEDERAL SPECIFICATION

FOR

THINNER; LACQUER *

This amendment was approved on the above date by the Director of Procurement, for the use of all departments and establishments of the Government, and shall become effective not later than February 15, 1945. It may be put into effect, however, at any earlier date after promulgation.

The following changes shall be made in Federal Specification TT-T-266, dated April 30, 1942:

Page 1:

Paragraph E-1a:

Line 2. Delete "0.820" and "0.860" and substitute "0.800" and "0.850", respectively.

Paragraph E-1b:

Line 2. Delete "80° C. (176° F.)" and substitute "70° C. (158° F.)"

Line 3. Delete "20" and substitute "45".

Line 5. Delete "50" and substitute "65".

Page TT-T-266-2:

Paragraph E-1c. Table:

Line 1. Column "Maximum." Delete "35" and substitute "40". Column "Minimum." Delete "25" and substitute "30".

Line 2. Delete "Hydrocarbons (coal tar and petroleum)" and substitute "Petroleum Hydrocarbons."

Line 3. Column "Maximum." Delete "20" and substitute "10". Column "Minimum." Delete "10" and substitute the character "—."

Paragraphs E-1m, E-1m (1), and E-1m (2). Delete in their entirety.

Pages TT-T-266-2 and 3:

Paragraph F-2b:

Line 2. Delete "100.14" and substitute "100.15".

Line 5. Delete "86-80" and substitute "86-40."

*Certain provisions of this specification are intended to conserve critical or strategic materials. When the present emergency is over, this amendment will be considered for revision.

621960-44

SB 8849

TT-T-266
Amend.-4-2
(Nov. 1944)

FEDERAL STANDARD STOCK CATALOG
(Section IV, Part 5)

Paragraph F-2c (2):

Line 1. Delete heading "Coal tar and petroleum hydrocarbon determination" and substitute "Petroleum hydrocarbon determination."

Line 9. Delete "coal tar and."

Pages TT-T-266-6 to 8, inc.:

Paragraphs F-2m to F-2n (7), including figure 1. Delete in their entirety.

Pages TT-T-266-8 and 9:

Paragraph H-1a. Renumber this Paragraph "H-2".

Paragraphs H-1b to H-2b (2) inclusive. Delete in their entirety, and substitute:

H-3. Navy.—

H-3a. Specifications.—

Navy Department specifications:

General Specifications for Inspection of Material.

39F16—General Specification for Packaging and Packing for Overseas Shipment.

42C29—Cans, Steel (Tin-Plate and Terne-Plate); and Cases, Shipping

42D3—Drums, Steel, Fifty-five Gallon

Federal specification:

TT-E-485—Enamel; Drum-Coating, Exterior, Rust-Inhibiting, Solvent-Resistant

Interstate Commerce Commission specification:

17E—Steel Drums, Single-Trip Container

Copies of the above-mentioned Navy Department and Federal specifications and of the Navy Shipment Marking Handbook may be obtained without cost upon application to the Bureau of Supplies and Accounts, Navy Department, Washington 25, D. C.

Copies of Interstate Commerce Commission Regulations for Shipment of Explosives and Other Dangerous Articles, etc., of which I. C. C. Specification 17E forms a part, may be obtained upon application, accompanied by money order, coupon, or cash to the Superintendent of Documents, Government Printing Office, Washington 25, D. C. Price 40 cents.

H-3b. Packaging.—

H-3b (1). For domestic shipment.—Unless otherwise specified, the lacquer thinner shall be furnished in 5-gallon square cans, 5-gallon closed top steel drums or in 55-gallon steel drums as specified in the contract or order.

H-3b (1) a. Five-gallon square cans shall be made of terneplate throughout and shall conform to the requirements of Navy Department Specification 42C29.

H-3b (1) b. Five-gallon closed top steel drums shall be made from 0.0239±0.005 inch (24 gage) steel throughout and shall conform to the requirements of Interstate Commerce Commission Specification 17E. Drums shall be plain on the inside and painted on the outside with an enamel conforming to the requirements of Federal Specification TT-E-485. The top of the drum shall be fitted with a 0.2092±0.005 inch (No. 5 U. S. gage) handle securely welded thereto and with a 1¼ inch screw neck and cap and inner seal. The screw cap shall have a suitable gasket to prevent leakage. Caps shall be painted on the outside with the same enamel used on the drum.

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(Nov. 1944)

H-3b (1) c. Fifty-five-gallon steel drums shall conform to the requirements of Navy Department Specification 42D3.

H-3b (2). For overseas shipment.—Unless otherwise specified, the lacquer enamel shall be furnished in 5-gallon closed top steel drums or 55-gallon steel drums as specified in the contract or order.

H-3b (2) a. Five-gallon closed top steel drums shall be as specified in paragraph H-3b (1) b.

H-3b (2) b. Fifty-five-gallon steel drums shall be as specified in paragraph H-3b (1) c.

H-3c. Packing.—

H-3c (1). For domestic shipment.—

H-3c (1) a. Unless otherwise specified, 5-gallon closed top steel drums and 55-gallon steel drums shall require no further packing.

H-3c (1) b. Unless otherwise specified, two 5-gallon square cans shall be packed in a nailed wood or wirebound box conforming to the requirements of Navy Department Specification 39P16, Sections VI and VII, respectively. No strapping will be required.

H-3c (2). For overseas shipment.—Unless otherwise specified, 5-gallon closed top steel drums and 55-gallon steel drums shall require no further packing.

H-3d. Marking.—

H-3d(1). Five-gallon square cans.—Unless otherwise specified, 5-gallon square cans shall be marked with the following information completed:

MATERIAL _____
SPECIFICATION NO. _____
QUANTITY _____
CONTRACTOR _____
MANUFACTURER _____

H-3d (2). Five-gallon steel drums, 55-gallon drums and shipping containers.—Unless otherwise specified, 5-gallon steel drums, 55-gallon drums and shipping containers shall be marked to conform with the requirements of Interstate Commerce Commission Regulations for Transportation of Explosives and other Dangerous Articles by Freight. They shall also be marked with the following information completed:

MATERIAL _____
SPECIFICATION NO. _____
QUANTITY _____
CONTRACTOR _____
MANUFACTURER _____
CONTRACT NO. _____
GROSS WEIGHT _____

In addition to the foregoing, marking shall conform to the requirements of the latest issue of the Navy Shipment Marking Handbook.

H-3e. Navy purchases except for the Bureau of Aeronautics will be made under this Federal specification. Bureau of Aeronautics purchases will be made under the issue in effect on date of invitation for bids of Army-Navy Aeronautical Specifications AN-TT-T-256 and AN-TT-T-258 and Navy Aeronautical Specification T-25.

SB 8850

TT-T-266
Amend-4-4
(Nov. 1944)

FEDERAL STANDARD STOCK CATALOG

(Section IV, Part 5)

Paragraph I-2. Insert subparagraphs I-2a and I-2a (1):
I-2a. The following formulation has been found to pass the requirements of this amendment:

	Weight (percent)	Volume (percent)
Butyl acetate	17	16
Ethyl acetate	20	19
Butyl alcohol	8	8
Ethyl alcohol	5	5
Petroleum naphtha	50	52
	100	100

I-2a (1). The type of petroleum naphtha is that described as Type I, Grade B (Low Aromaticity) in Army-Navy Aeronautical Specification AN-VV-N-96. Ketones, such as methyl ethyl ketone, are not required, although they may be used up to a maximum of 10 percent.

Page TT-T-266-10:

Paragraph I-6:

Line 4. Delete "15" and substitute "25."

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APRIL 30, 1942

FEDERAL STANDARD STOCK CATALOG

Section IV

(Part 5)

FEDERAL SPECIFICATION

FOR

THINNER; LACQUER

This specification was approved on the above date by the Director of Procurement, for the use of all departments and establishments of the Government, and shall become effective not later than October 15, 1942. It may be put into effect, however, at any earlier date after promulgation.

A. APPLICABLE SPECIFICATION.

A-1. The following Federal specification, of the issue in effect on date of invitation for bids, shall form a part of this specification:

VV-L-791.—Lubricants and Liquid Fuels; General Specifications (Methods for Sampling and Testing).

B. TYPE AND GRADE.

B-1. Thinner, as described herein, shall be furnished in one type and one grade.

C. MATERIAL.

C-1. See section E.

D. GENERAL REQUIREMENTS.

D-1. See section E.

E. DETAIL REQUIREMENTS.

E-1. The thinner shall be a clear liquid free from sediment or suspended matter. The thinner shall meet the following requirements:

E-1a. *Specific gravity*.—The specific gravity shall be not less than 0.820 and not more than 0.860 at 15.5°/15.5° C.

E-1b. *Distillation range*:

Initial boiling point—not below 80° C. (176° F.).

Portion distilling below 93° C. (200° F.)—not more than 20 percent.

Portion distilling below 104° C. (220° F.)—not more than 50 percent.

Portion distilling below 110° C. (230° F.)—not more than 75 percent.

End point—not above 155° C. (311° F.).

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E-1c. Component content:

	Percentage by weight	
	Maximum	Minimum
Esers.....	35	25
Hydrocarbons (coal tar and petroleum).....	50	40
Ketones.....	20	10
Alcohols and ethers.....	20	10

E-1d. *Nonvolatile matter*.—The nonvolatile matter shall be not more than 0.005 gram per 100 ml.

E-1e. *Color*.—The color shall be not darker than a solution of 0.0030 gram reagent quality potassium bichromate in one liter of distilled water.

E-1f. *Odor*.—The thinner shall leave no residual odor after drying on filter paper.

E-1g. *Spot test*.—The thinner shall pass the test specified under paragraph F-2g.

E-1h. *Water*.—The thinner shall pass the test specified under paragraph F-2h.

E-1i. *Sulfur*.—The thinner shall be free from sulfur in any form.

E-1j. *Acid value* (neutralization number).—Shall be not more than 0.28.

E-1k. *Copper corrosion*.—Shall pass the test specified under paragraph F-2k.

E-1l. *Benzol (benzene)*.—The thinner shall be free from benzol.

E-1m (1). Residue after subphonation with 38N H₂SO₄.

E-1m (2). Volume percent—not more than 5 percent.

E-1m (3). Refractive index at 20° C.—not less than 1.4080 and not more than 1.4125.

F. METHODS OF SAMPLING, INSPECTION, AND TESTS.

F-1. *Sampling*.—A single unit out of each lot of not more than 1,000 units shall be taken as representative of the whole. Whenever possible an original unopened container shall be sent to the laboratory, and when for any reason this is not done the inspector shall thoroughly mix the contents of the container sampled, transfer not less than 1 quart to a clean, dry glass bottle or tin can, which must be nearly filled with the sample, securely stoppered with a new, clean cork or well-fitting cover or cap sealed and distinctly labeled by the inspector. The inspector should take a duplicate from the container sampled to be held for check in case of dispute and, when requested, should take a sample for the seller.

F-2. *Laboratory examination*.—

F-2a. *Specific gravity*.—Determine the specific gravity by a convenient method.

F-2b. *Distillation range*.—Determine the distillation range by method 100.14 (distillation of gasoline, naphtha, kerosene, and similar petroleum products) of Federal Specification VV-1-791 (Lubricant and Liquid Fuels; General Specifications (Methods of Sampling and

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Testing), (similar to A. S. T. M. Standard No. D 86-80) (see par. F-2j).

F-2c. *Component content*.—

F-2c (1). *Esers determination*.—Place 100 ml. of the sample in a 150 ml. distillation flask, having a good fractionating column (not less than a 6-inch column of glass beads or the equivalent thereof). Slowly distill, collecting the distillate in a closed vessel kept in an ice bath. Stop the distillation when the vapor temperature reaches 93° C. (199.4° F.). Place 1 to 2 grams, accurately weighed, of both the distillate and the residue into separate tared ampules, seal and weigh. Place the ampules in 200-ml. Erlenmeyer flasks, containing one and one-half times the theoretical quantity N/2 alcoholic potassium hydroxide required for complete saponification (calculate on the basis that the residue portion contains butyl acetate and the distillate portion contains ethyl acetate). Break ampules with a stirring rod and attach reflux condensers to the flasks. Heat the flasks on a steam bath for at least 3 hours (4 hours may be necessary in certain instances). Shake the contents frequently. Cool, wash down the condensers with distilled water, remove condensers, and add three drops of phenolphthalein indicator to the contents of the flasks. Titrate contents of flasks with N/2 HCl. Two blanks of the alcoholic potassium hydroxide solution shall be run along with the sample. The blanks shall check within one-tenth of a milliliter. The saponifiable matter in the distillate portion shall be calculated as ethyl acetate; the saponifiable matter in the residue portion shall be calculated as butyl acetate. Combine the percentages, by weight, so calculated and report as total esters content of the thinner. (Factors: 1 ml. N/2 KOH=0.044 gram ethyl acetate=0.058 gram butyl acetate.)

F-2c (2). *Coal tar and petroleum hydrocarbon determination*.—Mix a 50-ml. portion of thinner with 50 ml. of sulfuric acid (80 ml. of concentrated sulfuric acid specific gravity 1.84 and 20 ml. of distilled water) in a 100-ml. ground glass stoppered graduated cylinder. It is advisable to cool the acid before adding to prevent possible excessive heat of reaction. Thoroughly mix the thinner and acid in the cylinder and allow to stand over night or until the mixture separates into two clear and distinct layers. The top layer or insoluble portion will consist of the coal tar and petroleum hydrocarbons. Record the volume of this layer. Carefully remove most of this layer and determine its specific gravity at 15.5°/15.5° C. (60/60° F.) by any convenient method. From the volume and specific gravity of the insoluble portion and the volume and specific gravity of the sample compute the percentage, by weight, of these hydrocarbons.

F-2c (3). *Ketones determination*.—

F-2c (3) a. *Sodium nitrophenylate reagent*.—Prepare a 0.05N solution of Na₂SO₃ and standardize carefully against K₂Cr₂O₇. Preserve in a stock bottle provided with a guard tube filled with soda lime.

F-2c (3) b. *Iodine reagent*.—Prepare a 0.1 N solution of iodine at the time of making the determination. Standardize by titrating against the 0.05 N Na₂SO₃, using 50 ml. portions of the iodine solution mixed with the same amounts of NaOH and H₂SO₄ as used in the determination of the sample (see par. F-2c (3) f).

F-2c (3) c. *Sodium hydroxide reagent*.—Prepare and standardize a 1 N solution of NaOH against 2 N H₂SO₄.

F-2c (3) d. *Sulfuric acid reagent*.—Prepare a 2 N solution of H₂SO₄ and check against the 1 N NaOH, adjusting the strength of the H₂SO₄ solution so that 25 ml. of the acid will neutralize 50 ml. of the NaOH.

F-2c (3) e. *Starch solution*.—Stir 2 to 3 gms. of potato starch or 5 gms. of soluble starch into 100 ml. of 1-percent salicylic acid solution, add 300 to 400 ml. of boiling water. Boil the mixture until the starch is practically dissolved and dilute to 1 liter.

F-2c (3) f. *Procedure*.—Transfer 1.7 ml. of the sample to a tared small ground glass stoppered, conical shaped, weighing bottle having a capacity of 12 to 15 ml., using a 2 ml. pipette graduated in 0.1 ml. Weigh the bottle and contents and determine the weight of the sample taken which should be 1.4 ± 0.1 gm. Invert the weighing bottle and hold the mouth under the surface of approximately 500 ml. of freshly boiled distilled water in a 1-liter beaker. Remove the stopper under the water by means of a glass rod with a hook on the end. Thoroughly wash out the bottle, transfer the water and thinner to a 1-liter flask and dilute to the mark at 20° C. (68° F.). Now pipette three 25-ml. aliquots into separate 750-ml. Erlenmeyer flasks containing 50 ml. each of the 1N NaOH solution. Into each flask while shaking constantly run 50 ml. of the 0.1N iodine. Stopper the flasks and allow to stand at about 20° C. (68° F.) (cooling necessary in warm weather) for at least 20 minutes. At the end of this time, pour 26 ml. of the 2N H₂SO₄ into the first flask and titrate immediately against the 0.05N, Na₂S₂O₃. The solution must be acid before any Na₂S₂O₃ is added; otherwise the determination will be ruined. When the color has almost faded out add starch solution and continue the titration until the blue color disappears and the bright yellow color of the iodoform suspension is reached. Read the milliliters of Na₂S₂O₃, apply the burette and temperature corrections and subtract the corrected reading from the average corrected blank. Calculate the percentage of ketones, by weight, from the following formula:

$$A = \frac{(B-S) \times N \times 0.9675 \times 40}{W}$$

Where A=percentage ketones by weight.

B=milliliters of Na₂S₂O₃ for titration of blank.

S=milliliters of Na₂S₂O₃ for titration of sample.

N=normality of Na₂S₂O₃, and

W=weight of sample taken for dilution.

NOTE.—The following precautions shall be observed:

1. Only boiled distilled water shall be used in preparing the solutions and throughout the determination.
2. Standardized glassware shall be used and burette and temperature corrections shall be applied to all readings.
3. Weight of sample taken and amount of iodine solution used shall be as specified. With these amounts the 35 to 40 percent excess of iodine, found to be optimum for completion of the iodoform reaction will be present. Use of the small glass-stoppered bottle described in

paragraph F-2c (3) f with the 2-ml. pipette insures uniformity in the weight of the sample.

4. Iodine solution shall be added slowly while shaking constantly. The National Bureau of Standards calibrated burette with fine tip and delivery time of approximately 2 minutes has been found very satisfactory.

5. A slight excess of acid shall be added just before the titration with thiosulphate. Too great an excess will give low results.

F-2c (4). *Alcohols and ethers determination*.—The difference between the sum of the percentages of the esters, hydrocarbons, and ketones content and 100 shall be considered the percentage of alcohols and ethers in the thinner and shall be so recorded.

F-2d. *Nonvolatile matter*.—One hundred milliliters of thinner shall be placed in a tared porcelain dish. Evaporate contents over a steam bath to almost dryness. Then heat dish and residue in an oven at 105° ± 2° C. (221° ± 4° F.) to constant weight. Determine the weight of nonvolatile matter in the dish. Report as grams per 100 ml. of thinner.

F-2e. *Color*.—Compare color of the sample with a solution of 0.0030 gram of reagent quality potassium bichromate in 1 liter of distilled water. Fill 100-ml. Nessler tubes with the sample and with the bichromate solution to a height of approximately 24.5 cm. The tubes shall have a colorless bottom and the sides shall be covered to eliminate side light. View the contents of the tubes from a point directly above tubes, using a white background beneath the bottom of the tubes. Compare colors of both tubes.

F-2f. *Odor*.—Dip strips of heavy filter paper of uniform shape and size in sample of thinner. Remove and allow to dry in a well ventilated room at a temperature of 21° to 32° C. (70° to 90° F.). Permit to dry for 2 hours. Examine for any residual odor.

F-2g. *Spot test*.—Place five drops of the thinner onto the center portion of a No. 40 Whatman filter paper. The center portion of the filter paper shall be free from contact with an undersurface. Allow to evaporate at a temperature of 21° to 32° C. (70° to 90° F.) away from direct sunlight. There shall be no stain or oily spot after a 2-hour drying period.

F-2h. *Water*.—Place 5 ml. of thinner in a ground glass-stoppered cylinder and add 25 ml. of 60° A. P. I. gasoline in 5-ml. portions, thoroughly shaking after each addition. The test shall be carried out at 20° to 25° C. (68° to 77° F.). No turbidity shall develop.

F-2i. *Sulfur*.—This test shall be carried out in connection with the distillation test (par. F-2b.). Place strips of moistened lead acetate paper and starch iodate paper at the end of the condenser tube. Discoloration of either or both papers indicates the presence of sulfur.

F-2j. *Acid value (neutralization number)*.—Place 50 ml. of the sample into a small Erlenmeyer flask and titrate with N/10 alcoholic (99 percent methyl alcohol) potassium hydroxide solution, using phenolphthalein as an indicator. Calculate the number of milligrams of potassium hydroxide required to neutralize one gram of thinner.

F-2k. *Copper corrosion*.—Place a clean strip of mechanically polished pure sheet copper, about ½ inch wide and 3 inches long, in a glass tube about ¾ inch in diameter and 18 inches long. Add sufficient sample to

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completely cover the strip and heat rapidly to boiling (the use of an oil bath maintained at a temperature slightly higher than the initial boiling point of the thinner is desirable). Maintain at this point for 30 minutes without actual distillation taking place. Examine copper strip after the boiling period for discoloration. Marked blackening or iridescence (a slight tarnish shall be disregarded) of the copper strip shall be considered as not conforming to the requirements of this specification.

F-21. Benzol (benzene).—Nitrate 6 ml. of thinner with 3 ml. of acid mixture (the acid mixture shall consist of equal volumes of concentrated sulfuric acid and nitric acid). Carry out the nitration in an Erlenmeyer flask immersed in cold water, and agitate to prevent reaction from becoming too violent. When the reaction stops, pour the contents of the flask into 500 ml. of distilled water. An odor of nitrobenzene indicates the presence of benzol (benzene) in the thinner.

F-2m. Sulphonation.—Place 20 ml. of 38 N (equivalent to 100.92 percent H_2SO_4) sulfuric acid in a graduated narrow-necked babcock flask, stopper, and place in ice water to cool. Add slowly, from a pipette, 5 ml. of the thinner to be examined. Gradually mix the contents, keeping warm, but being very careful that the temperature does not rise above $60^\circ C.$ ($140^\circ F.$). When the mixture no longer warms up on shaking, agitate thoroughly and place the flask in a water bath and heat at 60° to $65^\circ C.$ (140° to $149^\circ F.$) for not less than 10 minutes, keeping the contents of the flask thoroughly mixed by vigorous shaking for one-half minute each time, six times during the period. Do not stopper the flask after the thinner has been added, as it may explode. Cool to room temperature, fill the flask with concentrated sulfuric acid until the unsulphonated portion rises into the graduated neck and centrifuge from 4 to 5 minutes at not less than 1,200 revolutions per minute, or for 15 minutes at 900 revolutions per minute, or allow to stand, lightly stoppered, for 12 hours. Calculate the percentage, by volume, and determine the refractive index (at $20^\circ C.$) of the unsulphonated residue.

F-2m (1). Reagent for testing.—In a weighed glass-stoppered bottle (the regular 2½-liter acid bottle is of a convenient size) mix concentrated sulfuric acid (specific gravity 1.84) with fuming sulfuric acid. If the fuming acid used contains 50 percent excess SO_3 , the ratio of one part, by weight, of the former to three-fourths of a part, by weight, of the latter will give a mixture slightly stronger than the required strength. To determine the exact strength of this mixture in terms of H_2SO_4 , weigh exactly, in a weighing pipette of about 10-ml. capacity, approximately 20 g. of the acid. Allow it to flow down the sides of the neck into a 1,000-ml. volumetric flask containing about 200 ml. of distilled water. When the pipette has drained, wash all traces of the acid remaining in the pipette into the flask, taking precautions to prevent loss of SO_3 , and make up to the mark. Titrate 20-ml. portions, drawn from a burette, against half-normal alkali. Calculate the concentration in terms of the percentage of H_2SO_4 in the sample taken.

F-2m (2). In the same way determine the percentage of H_2SO_4 in the stock of concentrated acid (specific gravity 1.84). From these data calculate the quantity of the latter which must be added to the

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quantity of mixed acid in the weighed bottle to bring it to a concentration, in terms of H_2SO_4 , of 100.92 percent.

F-2m (3). After adjusting the concentration by the addition of the sulfuric acid (specific gravity 1.84), thoroughly shake the bottle of mixed acid and again determine its concentration. The allowable variation is ± 0.05 percent H_2SO_4 . Finally, as a check run a polymerization test on gum turpentine known to be pure. The residue should fall below 2 percent.

F-2m (4). Special precautions must be taken to prevent dilution of this acid by the absorption of atmospheric moisture. The arrangement shown in figure 1 is most suitable for storing and delivering measured quantities of this reagent.

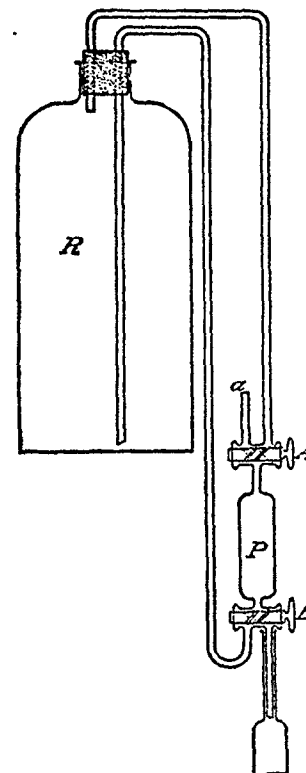


FIGURE 1—Acid bottle and pipette

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F-2m (5). With the three-way stopcocks *A* and *B* in the position shown, the acid is siphoned into the pipette *P*, the displaced air passing into *R*. To empty the pipette, *A* and *B* are turned to the position shown by the broken lines, air passing in at *a*.

F-2m (6). Tube *a* should be connected with a drying chamber filled with a suitable drying agent, so that the air is dried before entering the pipette *P*. The delivery tube should be completely drained and protected from atmospheric moisture. The stopcocks *A* and *B* should always be kept in the closed position except during the filling or draining of the pipette *P*. As a final precaution, it may be necessary to completely fill the pipette *P* and discard this acid before taking acid for use in making the determination.

F-2m (7). If the arrangement shown in figure 1 is not to be had, the acid should be kept in bottles with well-fitting glass stoppers of not more than one-half liter capacity.

G. PACKAGING, PACKING, AND MARKING FOR SHIPMENT.

G-1. Packaging.—Unless otherwise specified, commercial packages are acceptable under this specification.

G-2. Packing.—Unless otherwise specified, the subject commodity shall be delivered in standard commercial containers, so constructed as to insure acceptance by common or other carriers, for safe transportation, at the lowest rate, to the point of delivery.

G-3. Marking.—

G-3a. Issue packages.—Unless otherwise specified, each package shall be marked with the name of the material, the quantity contained therein, and the name of the manufacturer.

G-3b. Shipping containers.—Unless otherwise specified, shipping containers shall be marked with the name of the material and the quantity contained therein, as defined by the contract or order under which shipment is made, the name of the contractor, and the number of the contract or order.

H. REQUIREMENTS APPLICABLE TO INDIVIDUAL DEPARTMENTS.

H-1. The following departmental specifications, of the issue in effect on date of invitation for bids and special requirements, shall form a part of this specification, and shall be applicable to purchases made under this specification by the respective departments:

H-1a. Army.—United States Army Specification No. 100-2, Standard Specification for Marking Shipments. (Copies of this specification may be obtained by prospective bidders, without cost, upon application to the distributing agency indicated in the invitation for bids.)

H-1b. Navy.—Navy Department General Specification for Inspection of Materials, copies of which may be obtained without cost upon application to the Bureau of Supplies and Accounts, Navy Department, Washington, D. C.

H-2. Navy purchases.—

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H-2a. Navy purchases except for the Bureau of Aeronautics will be made under this Federal specification. Bureau of Aeronautics purchases will be made under the issue in effect on date of invitation for bids of Army-Navy Aeronautical Specifications AN-TT-T-256 and AN-TT-T-258 and Navy Aeronautical Specification T-25.

H-2b. Packaging and packing (except for the Bureau of Aeronautics).—

H-2b (1). Packaging.—Unless otherwise specified, commercial packages of the kinds, sizes, and types ordinarily used will be acceptable under this specification.

H-2b (2). Packing.—Unless otherwise specified, the subject commodity shall be delivered in substantial standard commercial containers, so constructed as to insure safe delivery by common or other carrier to the point of delivery at the lowest rate. Containers (cans), capacity 1 quart and less, may be packed in corrugated paper or solid fiber containers, the gross weight of which shall not exceed approximately 45 pounds. Containers of this type shall otherwise meet all requirements of Consolidated Freight Classification Rules in effect at the time of shipment. All seams, flaps, and openings shall be wire-stitched or stapled. Containers made of wood (boxes or cases) containing cans, capacity 1 quart and less, shall weigh not in excess of approximately 150 pounds gross when packed for shipment. Containers (cans), capacity in excess of 1 quart, shall be packed in substantial wooden cases, the gross weight of which shall not exceed approximately 150 pounds. Containers larger than 1 gallon shall meet all I. C. C. requirements, and shall be so labeled.

I. NOTES.

I-1. Purchasers should exercise any desired options offered herein.

I-2. Lacquer thinner, as described in this specification, is intended for use in connection with spraying lacquer (in accordance with Federal Specification TT-L-58).

I-3. It is believed that this specification adequately describes the characteristics necessary to secure the desired material, and that normally no samples will be necessary prior to award to determine compliance with this specification. If, for any particular purpose, samples with bids are necessary, they should be specifically asked for in the invitation for bids, and the particular purpose to be served by the bid sample should be definitely stated, the specification to apply in all other respects.

I-4. Federal specifications do not include all types, classes, grades sizes, etc., of the commodities indicated by the titles of the specifications, or which are commercially available, but are intended to cover the types, etc., which are suitable for Federal Government requirements.

I-5. An Index of Federal Specifications may be purchased as noted in paragraph below, price to be obtained from the Superintendent of Documents.

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I-6. Copies of this specification and of VV-L-791 may be obtained upon application, accompanied by money order, coupon, or cash, to Superintendent of Documents, Government Printing Office, Washington, D. C. Price of this specification, 5 cents; VV-L-791, 15 cents.

Notice.—When Government drawings, specifications or other data are used for any purpose other than in connection with a definitely related Government Procurement operation, the United States Government thereby incurs no responsibility nor any obligation whatsoever; and the fact that the Government may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data, is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use, or sell any patented invention that may be in any way related thereto.

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